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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/905,349	07/13/2001	Jay Brian DeDontney	A-67178-1/MSS	7344

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EXAMINER	
ZERVIGON, RUDY	

ART UNIT	PAPER NUMBER
1763	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/905,349	Applicant(s) DEDONTNEY ET AL.
	Examiner Rudy Zervigon	Art Unit 1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 11, 2003 has been entered.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-5, 8, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) in view of Ohashi (JP10-177960)[1]. Soichiro Kawakami teaches a gas delivery metering tube (Figure 1) for delivering a gas in a plasma CVD process comprising:

i. an elongated outer tube (3) having an inlet end (4/3 interface) and a closed end (opposite end), and one or more arrays of orifices (15) formed in the elongated outer tube (3) and extending along the substantial length of the elongated outer tube (3); an elongated inner tube (5) having open inlet (4/5 interface) and outlet (opposite 4/5 interface) ends, the elongated inner tube (5) being nested and axially aligned inside of the elongated outer tube (3) forming an effective annular space (20) there between, and wherein the outlet end of the

[1] Machine translation from http://www1.ipdl.jpo.go.jp

elongated inner tube (5) terminates prior to the closed end (opposite end) of the elongated outer tube (3).

Soichiro Kawakami further teaches the gas delivery metering tube further comprising a single gas supply port (inherent, feeding item 5, Figure 1) coupled to the inlet end (at cut away of item 5) of the elongated inner tube (5) for supplying gas to the metering tube.

Soichiro Kawakami does not teach:

i. a gas flow divider positioned adjacent the inlet ends of the elongated inner and outer tubes and having a first gas flow path coupled to the elongated inner tube (5) and a second gas flow path coupled to the annular space (20) between the elongated inner and outer tubes.

ii. a gas delivery metering tube wherein the cross sectional area of the inside of the elongated inner tube (5) is approximately equal to the total cross sectional area of the plurality of small orifices in a flow divider.

iii. Soichiro Kawakami's inner tube extends a distance at least encompassing the arrays of orifices in the outer tube

Ohashi teaches a fluid flow divider (upper portion of 41, Figure 4) having a first flow path ("Sz") and a second gas flow path (Sx) coupled to an annular space (Sx). Ohashi further teaches the fluid flow divider being a disk (Figure 4) having a central orifice (17a) forming the first gas flow path and a plurality of small orifices (17b) forming the second gas flow path.

Ohashi further teaches a gas flow divider (upper portion of 61, Figure 6) which comprises a flange (see L shape of U/21 face, Figure 6) on the inlet end of the elongated inner tube (21,

Figure 6), the flange having a lip (20, Figure 6) containing a plurality of small orifices (20a, Figure 6) forming the second gas flow path.

It would have been obvious to one of ordinary skill in that art at the time the invention was made to replace Soichiro Kawakami's support plate with Ohashi's fluid flow divider such that it is positioned adjacent the inlet ends of Soichiro Kawakami's elongated inner and outer tubes and having a first gas flow path coupled to Soichiro Kawakami's elongated inner tube and a second gas flow path coupled to Soichiro Kawakami's annular space between the elongated inner and outer tubes, including dimensioning Soichiro Kawakami's gas delivery metering tube and inner tube wherein the cross sectional area of the inside of the elongated inner tube (5) is approximately equal to the total cross sectional area of the plurality of small orifices (15) in the flow divider.

Motivation to replace Soichiro Kawakami's support plate with Ohashi's fluid flow divider such that it is positioned adjacent the inlet ends of Soichiro Kawakami's elongated inner and outer tubes and having a first gas flow path coupled to Soichiro Kawakami's elongated inner tube and a second gas flow path coupled to Soichiro Kawakami's annular space between the elongated inner and outer tubes is to distribute the delivered gas to both the elongated inner and outer tubes. Further, motivation to dimension Soichiro Kawakami's gas delivery metering tube and inner tube wherein the cross sectional area of the inside of the elongated inner tube is approximately equal to the total cross sectional area of the plurality of small orifices in the flow divider is to provide for the desired pressure gradient. Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725

F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

4. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) and Ohashi (JP10-177960) in view of Ishii (USPat. 5,685,942). Soichiro Kawakami and Ohashi are discussed above. Soichiro Kawakami and Ohashi do not teach:

i. a gas supply port comprising a block having a pocket formed therein, the pocket being sealed with a cover to create a confined passage, and a gas supply connector coupled to the pocket for receiving a gas and a hollow tube assembly coupled to the pocket and the inlet end (4/3 interface) of the inner and outer tube (3)s for conveying the gas.

Ishii teaches gas delivery system (91, 89, 85; Figure 4) for a wafer processing apparatus (column 3, lines 37-49). Specifically, Ishii teaches:

ii. a gas supply port (91; column 8, lines 16-22) comprising a pipe {block} having a pocket (conduit volume) formed therein, the pocket being sealed with a cover (pipe 91) to create a confined passage (conduit volume), and a gas supply connector (92) coupled to the pocket for receiving a gas and a hollow tube (89) assembly coupled to the pocket

It would have been obvious to one of ordinary skill in that art at the time the invention was made to replace the gas conduit of Soichiro Kawakami and Ohashi with Ishii's gas supply port comprising a block instead of a pipe shape.

Motivation to replace the gas conduit of Soichiro Kawakami and Ohashi with Ishii's gas supply port comprising a block instead of a pipe shape is to provide an alternate and equivalent means

for process gas delivery. Additionally, it has been established that the shape of a container is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container is significant (In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966); MPEP 2144.04).

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) and Ohashi (JP10-177960) in view of Lemp (USPat. 4,836,246). Soichiro Kawakami and Ohashi are discussed above. However Soichiro Kawakami and Ohashi do not teach one or more standoff spacers attached to the elongated inner tube to axially align the elongated inner tube inside the outer tube.

Lemp teaches a similar gas distribution arrangement (Figure 1; column 2, lines 24-40). Specifically, Lemp teaches a standoff spacer (16, Figure 1) attached to the elongated inner tube (32) to axially align the elongated inner tube (32) inside the outer tube (12).

It would have been obvious to one of ordinary skill in that art at the time the invention was made to add a standoff spacer attached to the elongated inner tube to axially align the elongated inner tube inside the outer tube in the Soichiro Kawakami and Ohashi apparatus as taught by Lemp.

Motivation to add a standoff spacer attached to the elongated inner tube to axially align the elongated inner tube inside the outer tube in the Soichiro Kawakami and Ohashi apparatus as taught by Lemp is to support the elongated inner and outer tubes (column 2, lines 35-40).

6. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) and Ohashi (JP10-177960) in view of DeDontney, Jay B. et al (USPat. 5,849,088). Soichiro Kawakami and Ohashi are discussed above. Soichiro Kawakami and Ohashi do not teach at least one injector assembly having at least one port for receiving the gas

delivery metering tube. Soichiro Kawakami and Ohashi do not teach at least one shield assembly having at least one plenum for receiving the gas delivery metering tube.

DeDontney teaches a similar gas delivery system (Figure 3; column 5, line 61 – column 6, line 34). Specifically, DeDontney teaches an injector (14, Figure 3) and at least one shield assembly (40c,d; Figure 4) having at least one plenum (78) for a gas delivery metering tube (80).

It would have been obvious to one of ordinary skill in that art at the time the invention was made to provide a port in DeDontney's injector assembly for Soichiro Kawakami' and Ohashi's gas delivery metering tube including replacing DeDontney's gas delivery metering tube with Soichiro Kawakami's and Ohashi's gas delivery metering tube.

Motivation to provide a port in DeDontney's injector assembly for Soichiro Kawakami' and Ohashi's gas delivery metering tube including replacing DeDontney's gas delivery metering tube with Soichiro Kawakami's and Ohashi's gas delivery metering tube is to distribute process gas as taught by Soichiro Kawakami.

Response to Arguments

7. Applicant's arguments filed December 11, 2003 have been fully considered but they are not persuasive.

8. Applicant states "Kawakami does not teach or suggest the nested, axially aligned inner and outer tubes as recited in Claims 1 and 11.". The Examiner strongly disagrees. Applicant is again referred to the body of the above claim rejections and Kawakami's clear demonstration of Applicant's "nested, axially aligned inner and outer tubes as recited in Claims 1 and 11" as detailed in Kawakami's Figures 1 and 2.

9. Applicant further states "Kawakami does not teach an elongated inner tube that extends a distance at least encompassing arrays of orifices in an elongated outer tube" as is presently amended. On this and similar positions, and per the disclosure of Kawakami as shown in Figure 1, the Examiner agrees. However, as stated above, it is the position of the Examiner that:

"

It would have been obvious to one of ordinary skill in that art at the time the invention was made to ... including dimensioning Soichiro Kawakami's gas delivery metering tube and inner tube wherein the cross sectional area of the inside of the elongated inner tube (5) is approximately equal to the total cross sectional area of the plurality of small orifices (15) in the flow divider. Motivation ... to dimension Soichiro Kawakami's gas delivery metering tube and inner tube wherein the cross sectional area of the inside of the elongated inner tube is approximately equal to the total cross sectional area of the plurality of small orifices in the flow divider is to provide for the desired pressure gradient. Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

"

In particular, the obviousness to optimize the dimension of the gas delivery metering tube and inner tube is established according to Kawakami's to provide for the desired pressure gradient which effects Kawakami's "reaction gas is supplied stably and uniformly" (Constitution, Abstract).

10. Applicant further states "Nor does Kawakami teach or suggest a gas flow divider that divides a gas into a first gas flow into the inner tube and a second gas flow into an annular space defined by the inner and outer tubes, and the first gas flow flows out of the outlet end of the inner tube and into the annular space." As is presently amended. However, the Examiner's original instructions in the body of the rejected claims teaches Applicant's gas flow divider function:

"

It would have been obvious to one of ordinary skill in that art at the time the invention was made to replace Soichiro Kawakami's support plate with Ohashi's fluid flow divider such that it is positioned adjacent the inlet ends of Soichiro Kawakami's elongated inner and outer tubes and having a first gas flow path coupled to Soichiro Kawakami's elongated inner tube and a second gas flow path coupled to Soichiro Kawakami's annular space between the elongated inner and outer tubes, ...

Motivation to replace Soichiro Kawakami's support plate with Ohashi's fluid flow divider such that it is positioned adjacent the inlet ends of Soichiro Kawakami's elongated inner and outer tubes and having a first gas flow path coupled to Soichiro Kawakami's elongated inner tube and a second gas flow path coupled to Soichiro Kawakami's annular space between the elongated inner and outer tubes is to distribute the delivered gas to both the elongated inner and outer tubes.

...

"

11. Applicant states that the Examiner labels Ohashi's item 17 in Figure 4 as Applicant's gas flow divider (page 6, lines 1-2). Applicant has mischaracterized the Examiner's rejection which clearly states "Ohashi teaches a fluid flow divider (upper portion of 41, Figure 4) having a first

flow path ("Sz") and a second gas flow path (Sx)..." (see above and all prior actions). Applicant's arguments (page 6, first paragraph) based on this mischaracterization are dismissed. Further, Applicant conveys that his gas flow divider "divides a gas from a single gas supply port into a first gas flow via a first gas flow path and a second gas flow via a second flow path.". In particular, the Examiner has stated "It would have been obvious to one of ordinary skill in that art at the time the invention was made to replace Soichiro Kawakami's support plate (4) with Ohashi's fluid flow divider". In doing so, the resulting apparatus would divide a gas from a single gas supply port (below Ohashi fluid flow divider (upper portion of 41, Figure 4)) into a first gas flow (Ohashi's Sx) via a first gas flow path and a second gas flow (Ohashi's Sz) via a second flow path.

12. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Examiner believes there is teaching, suggestion, and motivation to replace Soichiro Kawakami's support plate (4) with Ohashi's fluid flow divider. In particular, both references are geometrically similar and are concerned with the gas flow velocity in the radial direction (normal to the axis of symmetry of both cylinders) – see "Solution" abstract of Ohashi and Kawakami's flow delivery across buffers 18, 19, and 20 to effect gas supply "stably and uniformly".

13. Applicant's arguments concerning Lemp (4,836,246) are not persuasive. The Examiner believes Lemp teaches standoff spacers (16, Figure 1 – Lemp's "support means") attached to the elongated inner tube (32) to axially align the elongated inner tube (32) inside the outer tube (12). In particular, Lemp clearly shows structure in Lemp's support means functioning to axially align the elongated inner tube (32) inside the outer tube (12). Applicant's "standoff spacers" (40; Figures 11a,c) are structurally and functionally identical to Lemp's support means.

14. Applicant states that DeDontney does not teach a gas flow metering tube. The Examiner disagrees. Refer to DeDontney (column 7, lines 45-55).

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272.1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (571) 272-1439.

Rudy Zervigon
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15:19